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12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/658,463

Applicant(s)

SATO ET AL.

Examiner

Jin-Cheng Wang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/20/2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,6-10,12-19,24-29 and 31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6-10,12-19,24-29 and 31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Response to Amendment

The amendment filed on 11/20/2003 has been entered. Claims 1, 10, 19 and 31 have been amended and Claim 32 has been newly added. Claims 1, 3, 4, 6-10, 12-19, 24-29, 31, and 32 are pending in the present application.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1,3,4,6-10,12-19,24-29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohshima et al. U.S. Patent No. 6,522,312 (hereinafter Ohshima) in view of Latypov U.S. Patent No. 6,624,853 (Latypov) and Sato U.S. Patent No. 6,445,815 (hereinafter Sato).

3. Claim 1:

(1) Ohshima teaches an augmented reality presentation apparatus for superimposing a virtual object in a real space, characterized by comprising:

Objective viewpoint augmented reality presentation means for superimposing the virtual object viewed from a first viewpoint position, which differs from any player's viewpoint

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position, in the real space viewed from the first viewpoint position (e.g., figure 2, 7; column 7-8; column 14-15), wherein said objective viewpoint augmented reality presentation means includes

First video sensing means for sensing a video of the real space viewed from the first viewpoint position (e.g., camera or CCD 230; figure 2 and 7; column 7-8; column 14-15);

First video generation means for generating a video of the virtual object viewed from the first viewpoint position (e.g., figure 2 and 7; column 7-8; column 14-17);

First video composition means for composing an augmented reality video viewed from the first viewpoint position on the basis of the videos of the real space and the virtual object viewed from the first viewpoint position (e.g., figure 2 and 7; column 7-8; column 14-15), and

Objective viewpoint video display means for displaying the augmented reality video obtained from said first video composition means (e.g., figure 2 and 7; column 7-8; column 14-15);

wherein said apparatus further comprises:

Player's viewpoint augmented reality presentation means for superimposing the virtual object viewed from the player's viewpoint position in the real space viewed from the player's viewpoint position (e.g., figure 2 and 7; column 3-6; column 11-13);

wherein said player's viewpoint augmented reality presentation means includes

Second video sensing means for sensing a video of the real space viewed from the player's viewpoint position (e.g., figure 2 and 7; column 3-6; column 11-13);

Player's viewpoint position acquiring means for acquiring information indicating the player's viewpoint position (e.g., figure 2 and 7; column 3-6; column 11-13);

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Second video generation means for generating a video of the virtual object viewed from the player's viewpoint position using the information indicating the player's view position (e.g., figure 2 and 7; column 3-6; column 11-13);

Second video composition means for composing an augmented reality video viewed from the player's viewpoint position on the basis of the videos of the real space and the virtual object viewed from the player's viewpoint position (e.g., figure 2 and 7; column 3-6; column 11-13); and

Display means for displaying to the player the augmented reality video viewed from the player's viewpoint position (e.g., figure 2 and 7; column 3-6; column 11-13).

(2) However, it is not clear whether Ohshima teaches implicitly display means for displaying the augmented reality videos on a predetermined display apparatus that is separate from THE player's display apparatus.

(3) Latypov teaches display means for displaying the augmented reality videos including displaying the image in virtual space on a predetermined display apparatus and the superimposed image from the real space and virtual space on a separate display apparatus (e.g., Latypov column 11).

(4) Ohshima at least suggests display means for displaying the augmented reality videos on a predetermined display apparatus (displaying the image on a table in a real environment) that is separate from any player's display apparatus (See Ohshima figure 7; column 11, lines 50-65; column 12-13) and Ohshima teaches display means for displaying the augmented reality videos on a display apparatus (displaying the image on a table in a real environment or displaying the mixed reality image on other player's display apparatus or displaying the mixed reality image on

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the left/right-hand side HMD) that is separate from ONE of the player's display apparatus (See Ohshima figure 7; column 11, lines 50-65; column 12-13).

(5) One having the ordinary skill in the art would have been motivated to do this because it would have provided a separate display device for viewing by the players.

Claim 3:

The apparatus according to claim 1, characterized in that said player's viewpoint augmented reality presentation means further comprises: the second video generation means for generating a video of the virtual object viewed from said player's viewpoint position; and the display means for displaying to the player the video of the virtual object viewed from said player's viewpoint position on a display surface through which the player can visually see the real space.

Claim 3 recites all the limitations of claim 1 and adds the limitation of "the second video generation means" and "the display means." Ohshima teaches a video generation means and display means (e.g., figure 2 and 7; column 3-6; column 11-13).

Claim 4:

The apparatus according to claim 1, characterized by further comprising information generation means for generating information that pertains to rendering of the virtual object, and in that said first video generation means and said second video generation means generate videos of the virtual object using the information that pertains to rendering of the virtual object.

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Claim 4 recites all the limitations of claim 1 and adds the limitation of “information generation means” and “generation means generate videos.” Ohshima teaches an information generation means (e.g., figure 2 and 7; column 3-6; column 11-13).

Claim 6:

The apparatus according to claim 1, characterized in that parameters of said first video sensing means are known, and said first video generation means generates the video of the virtual object viewed from said first viewpoint position in accordance with the known parameters.

Claim 6 recites all the limitations of claim 1 and adds the limitation of “the known parameters.” Ohshima teaches the known parameters such as the focal length of the camera, the width of the imaging surface of the camera (Ohshima column 20).

Claim 7:

The apparatus according to claim 1, characterized in that some of parameters of said first video sensing means are variable, said apparatus further comprises measurement means for measuring changes of the parameters, and said first video generation means generates the video of the virtual object viewed from said first viewpoint position in accordance with the parameters measured by said measurement means.

Claim 7 recites all the limitations of claim 1 and adds the limitation of “variable parameters” and “measurement means.” Ohshima teaches measuring the racket positions, generating and correcting view position and posture of the players (Ohshima column 15-18).

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Claim 8:

The apparatus according to claim 7, characterized in that the parameters of said first video sensing means measured by said measurement means include at least one of a viewpoint position/posture, and zoom ratio.

Claim 8 recites all the limitations of claim 7 and adds the limitation of “position/posture information.” Ohshima teaches measuring the mallet positions, generating and correcting view position and posture of the players (Ohshima column 15-18).

Claim 9:

The apparatus according to claim 1, characterized in that when a plurality of first video sensing means equivalent to said first video sensing means are present, said apparatus further comprises selection means for receiving a plurality of videos of the real space from said first viewpoint position from the plurality of first video sensing means, and outputting a video of the real space viewed from said first viewpoint position from one selected first video sensing means to said first video composition means, and said first video composition means generates a video of the virtual object viewed from said first viewpoint position using parameters of the first video sensing means selected by said selection means.

Claim 9 recites all the limitations of claim 1 and adds the limitation of “selection means for receiving a plurality of first video sensing means.”

Ohshima teaches selecting of the image regions (Ohshima column 15-18) and cameras for sensing a scene in front of them where image signals that represent an environment scene of a real space (Ohshima figure 2 and 7; column 3-6; column 11-13).

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4. Claim 10:

The claim 10 is a rephrasing of the claim 1 in a method form. The claim is rejected for the same reason as set forth in claim 1.

Claim 12:

The apparatus according to claim 10, characterized in that said player's viewpoint augmented reality presentation step further comprises: the second video generation step of generating a video of the virtual object viewed from said player's viewpoint position; and the display step of displaying to the player the video of the virtual object viewed from said player's viewpoint position on a display surface through which the player can visually see the real space.

Claim 12 recites all the limitations of claim 10 and adds the limitation of "the second video generation step" and "the display step."

Ohshima teaches the second video generation step and the display step (Ohshima figure 2 and 7; column 3-6; column 11-13).

Claim 13:

The method according to claim 10, characterized by further comprising information generation step of generating information that pertains to rendering of the virtual object, and in that said first video generation step and said second video generation step generate videos of the virtual object using the information that pertains to rendering of the virtual object.

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Claim 13 recites all the limitations of claim 10 and adds the limitation of “information generation step” and “first and second generation steps to generate videos.”

Ohshima teaches the information generation step and the first and second generation steps to generate videos (Ohshima figure 2 and 7; column 3-6; column 11-13).

Claim 14:

The apparatus according to claim 13, characterized in that said information generation step includes the step of generating information of an outer appearance of the virtual object and information of a position/posture of the virtual object as the information that pertains to rendering of the virtual object.

Claim 14 recites all the limitations of claim 13 and adds the limitation of “generating information of an outer appearance of the virtual object and information of a position/posture of the virtual object.”

Ohshima teaches generating and correcting view position and posture of the players (Ohshima column 18).

Claim 15:

The method according to claim 10, characterized in that parameters of said first video sensing means are known, and said first video generation step includes the step of generating the video of the virtual object viewed from said first viewpoint position in accordance with the known parameters.

Claim 15 recites all the limitations of claim 10 and adds the limitation of “the known parameters.” Ohshima teaches the known parameters such as the focal length of the camera, the width of the imaging surface of the camera (Ohshima column 20).

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Claim 16:

The method according to claim 10, characterized in that some of parameters of means for sensing a video viewed from said first viewpoint position are variable, said method further comprises the measurement step of measuring changes of the parameters, and said first video generation step includes the step of generating the video of the virtual object viewed from said first viewpoint position in accordance with the parameters measured in the measurement step.

Claim 16 recites all the limitations of claim 10 and adds the limitation of “variable parameters” and “measurement step.”

Ohshima teaches measuring the mallet position, generating and correcting view position and posture of the players (Ohshima column 15-18).

Claim 17:

The method according to claim 16, characterized in that the parameters of the means for sensing a video viewed from said first viewpoint position measured in the measurement step include at least one of a viewpoint position/posture, and zoon ratio.

Claim 17 recites all the limitations of claim 16 and adds the limitation of “position/posture information.” Ohshima teaches correcting view position and posture of the players (Ohshima column 15-18).

Claim 18:

The method according to claim 10, characterized in that when a plurality of means for sensing a video viewed from said first viewpoint position are present, said method further

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comprises the selection step of receiving a plurality of videos of the real space viewed from a first viewpoint position from the plurality of means for sensing a video viewed from said first viewpoint position, and outputting the video of the real space viewed from a first viewpoint position input from one selected means for sensing a video of said first viewpoint position to means for compositing a first viewpoint video, and said first video composition step includes the step of generating a video of the virtual object viewed from said first viewpoint position using parameters of the means for sensing a video viewed from a first viewpoint position selected in the selection step.

Claim 18 recites all the limitations of claim 10 and adds the limitation of “selection step for receiving a plurality of videos.”

Ohshima teaches selecting of the image regions (Ohshima column 15-18) and cameras for sensing a scene in front of them where image signals that represent an environment scene of a real space (Ohshima figure 2 and 7; column 3-6; column 11-13).

5. Claim 19:

(1) The claim 19 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of “a storage medium storing a program code.

(2) It is unclear whether Ohshima has implicitly taught a storage medium storing a program code.

(3) However, Sato discloses the claimed limitation of a storage medium that stores an image processing program, which is implemented on a computer and continuously presents

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three-dimensional images to an observer/player, storing a program code of an augmented reality, a depth estimation program code, a depth image generation program code, a position/posture information estimation program code, a warping program code and a program code of presenting to the observer three-dimensional images. The Sato reference implicitly teaches a program code including the augmented reality presentation step of generating and presenting a virtual image in a real space in which an image of merged real objects and virtual objects are displayed in LCDs 103 in an optical see-through head mounted device (column 1, lines 13-23). The Sato reference also implicitly teaches a position/posture estimation module 201 that outputs three-dimensional motions from a viewpoint position of the camera to right and left viewpoint positions of the player (column 12, lines 54-65). The Sato reference further teaches a depth image generation module 300 that uses position/posture information input from the position/posture estimation module 201 as that for CG rendering and which generates an augmented reality image using the three-dimensional CG database in accordance with the distance to an object in the real world expressed by the depth image and presents it on the LCDs 103 (column 12, lines 44-50) and a depth warping module 203 to inversely project a depth image ID acquired at a viewpoint having position/posture information into a space, and to re-project it onto the imaging plane of the virtual camera with the focal length of the virtual camera assumed at the viewpoint having an estimated position/posture value by the viewpoint position/posture module 201 (column 13, lines 32-48).

(4) Ohshima at least suggests program codes illustrated in a variety of flow charts (See Ohshima figure 7, 8, 9, 10, 14, 16, 17, 23).

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(5) One having the ordinary skill in the art would have been motivated to do this because it would have provided the installation and implementation of the image processing on other systems.

Claim 24:

The medium according to claim 19, characterized in that parameters of means for sensing said first viewpoint video are known, and the program code of said first video generation step includes the step of generating the video of the virtual object viewed from said first viewpoint position in accordance with the known parameters.

Claim 24 recites all the limitations of claim 19 and adds the limitation of “the known parameters.”

Ohshima teaches the known parameters such as the focal length of the camera, the width of the imaging surface of the camera (Ohshima column 20).

Claim 25:

The medium according to claim 19, characterized in that some of parameters of means for sensing a video viewed from said first viewpoint position are variable, the program code of said medium further comprises the measurement step of measuring changes of the parameters, and the program code of said first video generation step includes the step of generating the video of the virtual object viewed from said first viewpoint position in accordance with the parameters measured in the measurement step.

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Claim 25 recites all the limitations of claim 19 and adds the limitation of “variable parameters” and “measurement step.”

Ohshima teaches measuring the mallet positions, generating and correcting view position and posture of the players (Ohshima column 15-18).

Claim 26:

The medium according to claim 25, characterized in that the parameters of the means of sensing a video viewed from said first viewpoint position measured in the measurement step include at least one of a viewpoint position/posture, and zoom ratio.

Claim 26 recites all the limitations of claim 25 and adds the limitation of “position/posture information.”

Ohshima teaches measuring the mallet positions, generating and correcting view position and posture of the players (Ohshima column 15-18).

Claim 27:

The medium according to claim 19, characterized in that when a plurality of means for sensing a video viewed from said first viewpoint position are present, said medium further comprises a program code of the selection step of receiving a plurality of videos of the real space viewed from a first viewpoint position from the plurality of means for sensing a video viewed from said first viewpoint position, and outputting the video of the real space viewed from a first viewpoint position input from one selected means for sensing a video of said first viewpoint position to means for compositing a first viewpoint video, and the program code of said first video composition step includes the step of generating a video of the virtual object

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*viewed from said first viewpoint position using parameters of the means for sensing a video
viewed from a first viewpoint position selected in the selection step.*

Claim 27 recites all the limitations of claim 19 and adds the limitation of “selection step for receiving a plurality of videos.”

Ohshima teaches selecting of the image regions (Ohshima column 15-18) and cameras for sensing a scene in front of them where image signals that represent an environment scene of a real space (Ohshima figure 2 and 7; column 3-6; column 11-13).

6. Claims 28-29:

Referring to claims 28-29, Ohshima discloses a mixed reality presentation system that generates and presents a virtual image in a real space (see figures 2 and 7 of Ohshima). However, the reference is silent on a printing means in connection to the mixed reality presentation apparatus. It is common that a computer system has a printing means attached to them. Therefore, it would have been obvious to one having ordinary skill in the art to have incorporated a printing means in the mixed reality presentation apparatus of Ohshima because such construction is rather conventional. A person of ordinary skill in the art would be motivated to have incorporated a printing means to the Ohshima's mixed reality presentation apparatus to further provide a paper copy of still images of the real images that have been displayed on the display devices of Ohshima.

7. Claim 31:

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The claim 31 encompasses the same scope of invention as that of claim 1. The claim is subject to the same reasons set forth in claim 1.

8. Claim 32:

The claim 32 encompasses the same scope of invention as that of claim 1. The claim is subject to the same reasons set forth in claim 1.

Remarks

9. Applicant's arguments, filed 11/20/2003, paper number 11, have been fully considered but they are not deemed to be persuasive.

10. Applicant argues in essence with respect to the amended Claim 1 and similar claims that:

a. "Claim 1 has been amended as discussed during the interview, to further clarify that the term 'independently' means --separate--. Also, the term 'any' has been inserted to clarify that, if more than one player is present, the first viewpoint position cannot be the viewpoint of another player... For the foregoing reasons, Applicants submit that this application is in condition for allowance"

In response, the Examiner asserts that Ohshima/Latypov/Sato meets the claim limitations set forth in the amended Claim 1. Although Ohshima lacks a full disclosure of display means for displaying the mixed reality videos on a predetermined display apparatus that is separate from any player's display apparatus, Latypov teaches display means for displaying the augmented reality videos including displaying the image in virtual space on a predetermined display apparatus and the superimposed image from the real space and virtual space on a separate display apparatus (e.g., Latypov column 11). However, Ohshima at least suggests display means

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for displaying the augmented reality videos on a predetermined display apparatus (displaying the image on a table in a real environment) that is separate from any player's display apparatus (See Ohshima figure 7; column 11, lines 50-65; column 12-13) and Ohshima teaches display means for displaying the augmented reality videos on a display apparatus (displaying the image on a table in a real environment or displaying the mixed reality image on other player's display apparatus or displaying the mixed reality image on the left/right-hand side HMD) that is separate from ONE of the player's display apparatus (See Ohshima figure 7; column 11, lines 50-65; column 12-13). One having the ordinary skill in the art would have been motivated to do this because it would have provided a separate display device for viewing by the players. Therefore, Ohshima/Latypov/Sato fulfills the amended Claim 1 as currently drafted.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

12. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

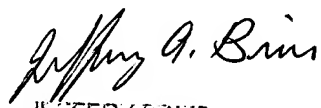
13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jin-Cheng Wang whose telephone number is (703) 605-1213.

The examiner can normally be reached on 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Razavi can be reached on (703) 305-4713. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-6606 for regular communications and (703) 308-6606 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 395-3900.

jcw
December 30, 2003


JEFFERY BRIN
PRIMARY EXAMINER